

1/21

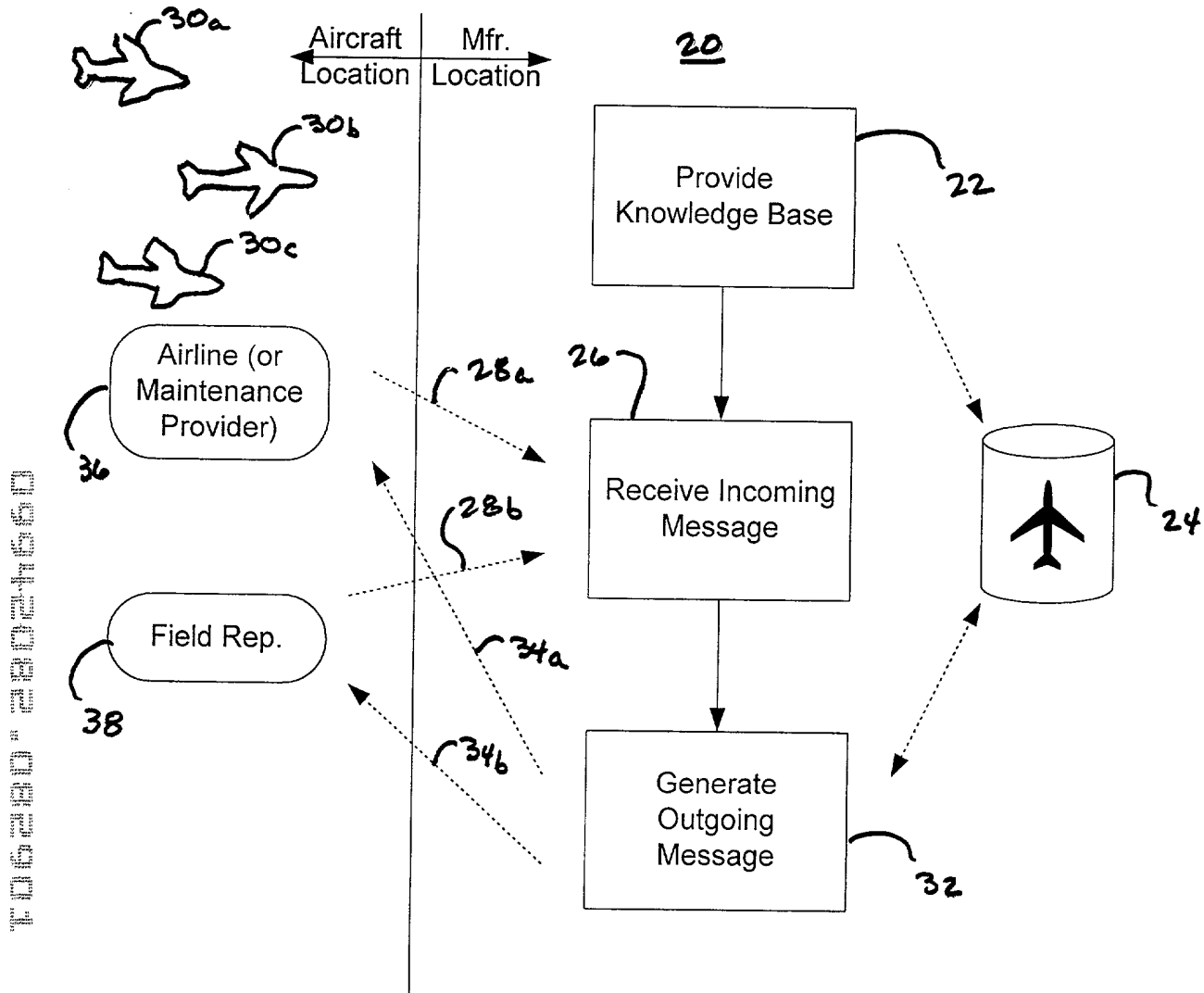


FIG. 1

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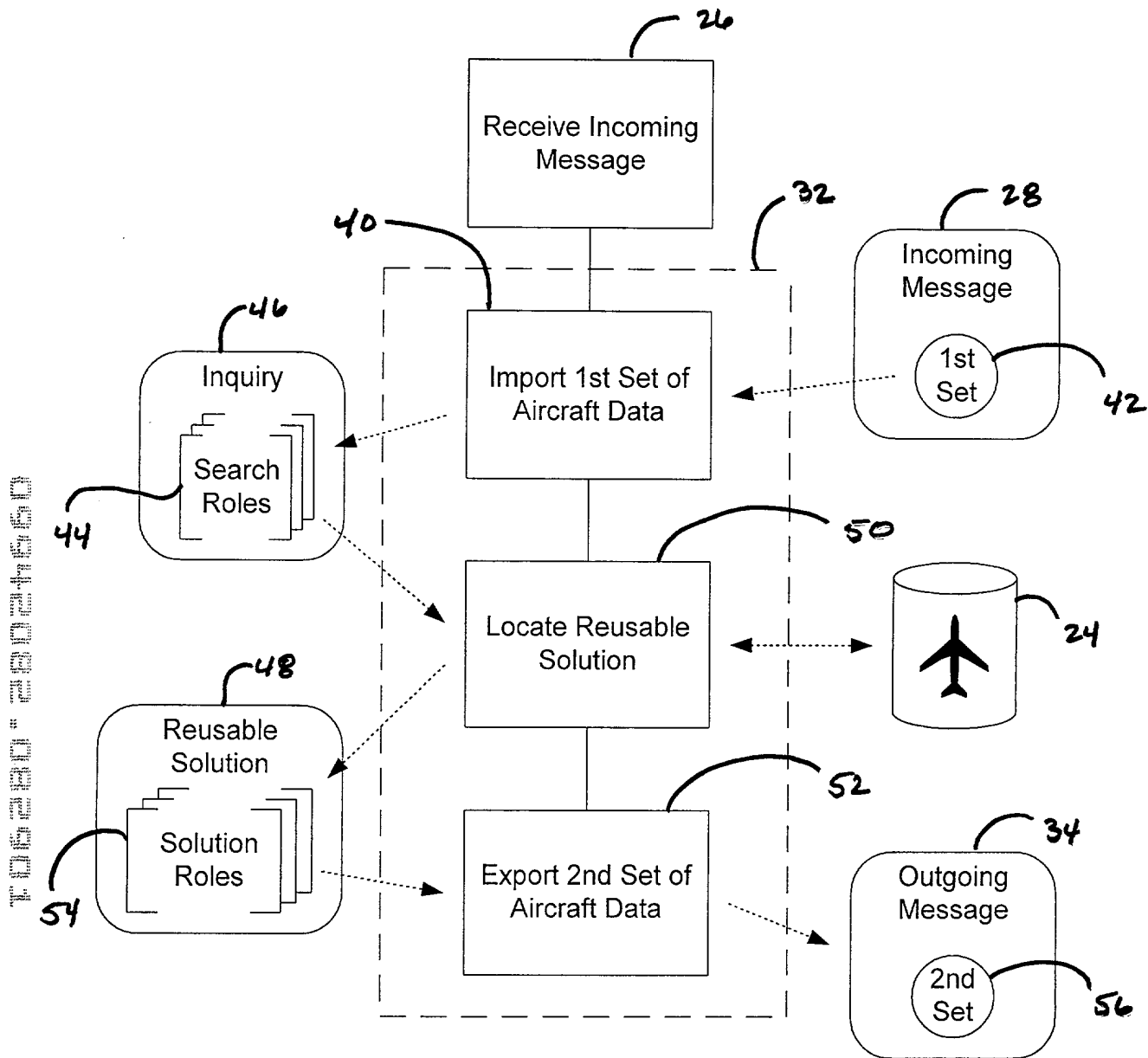


FIG. 2

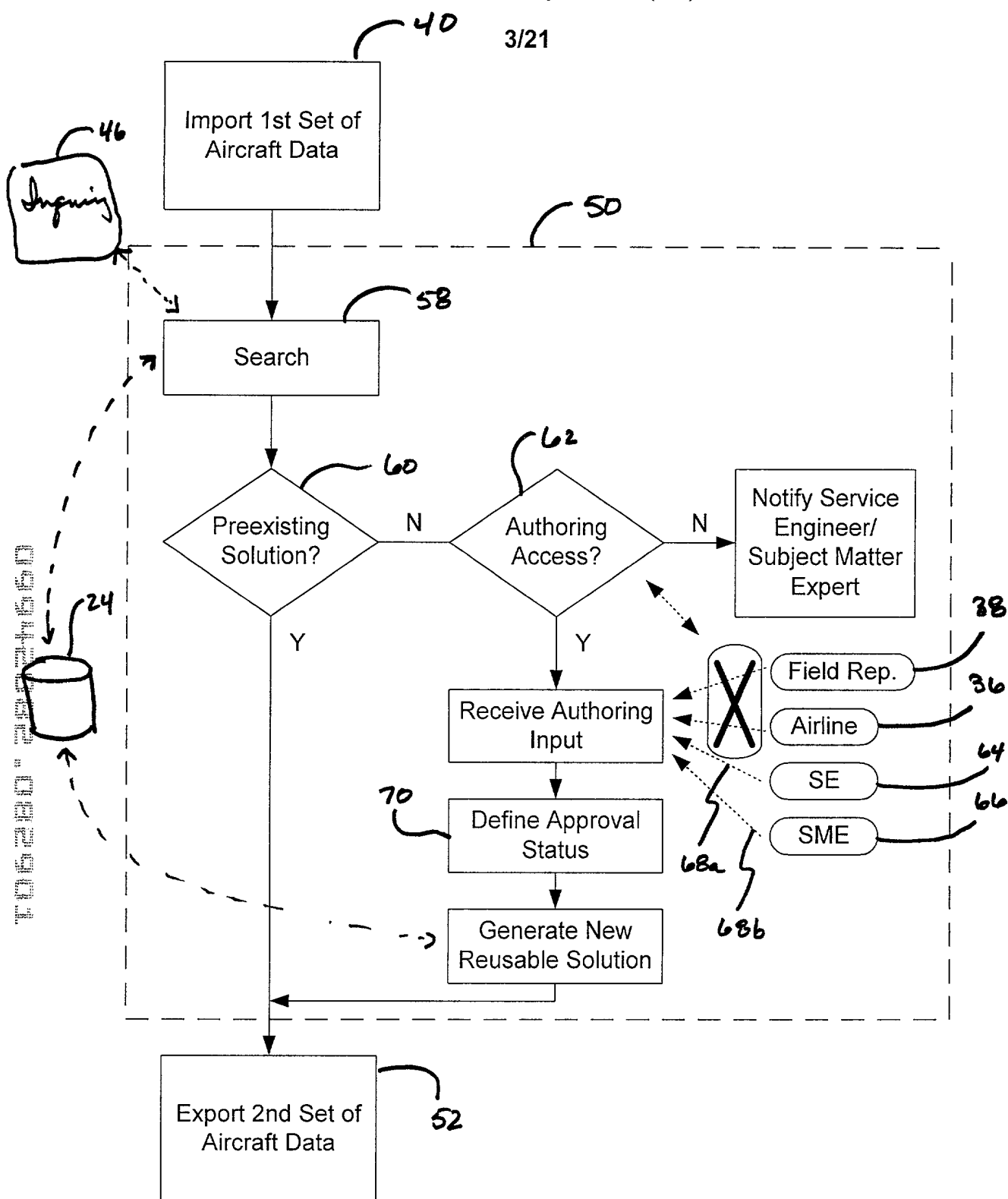


FIG. 3

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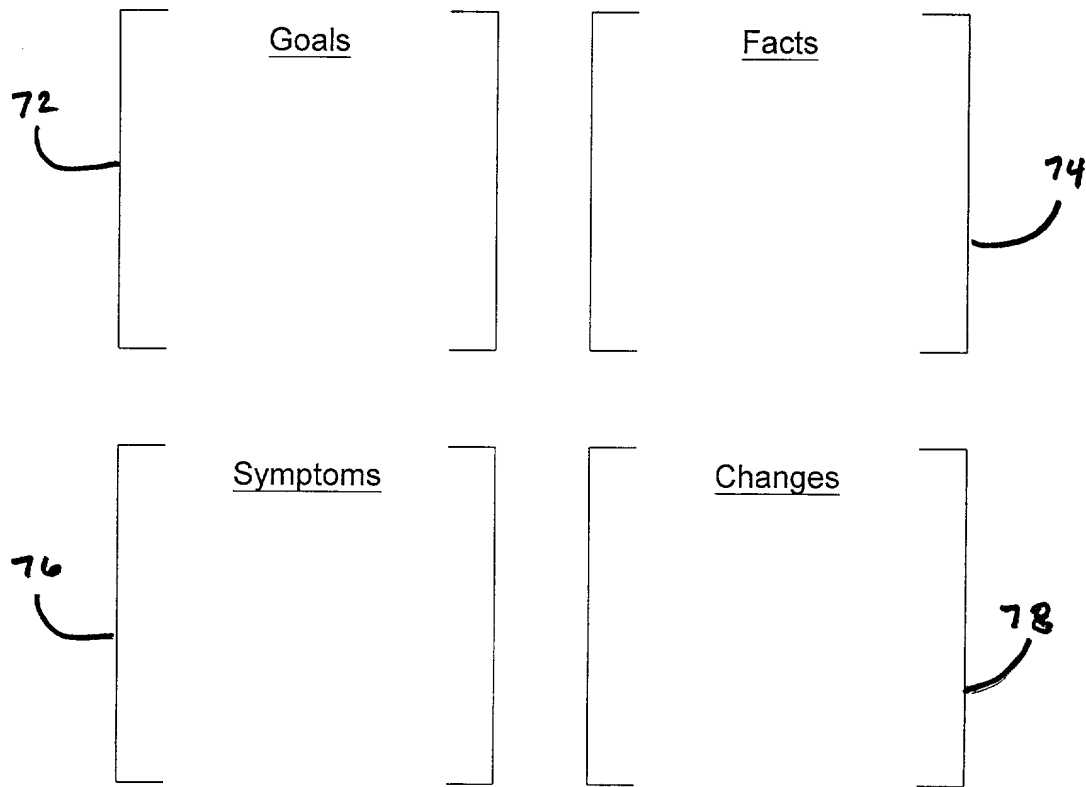


FIG. 4

54

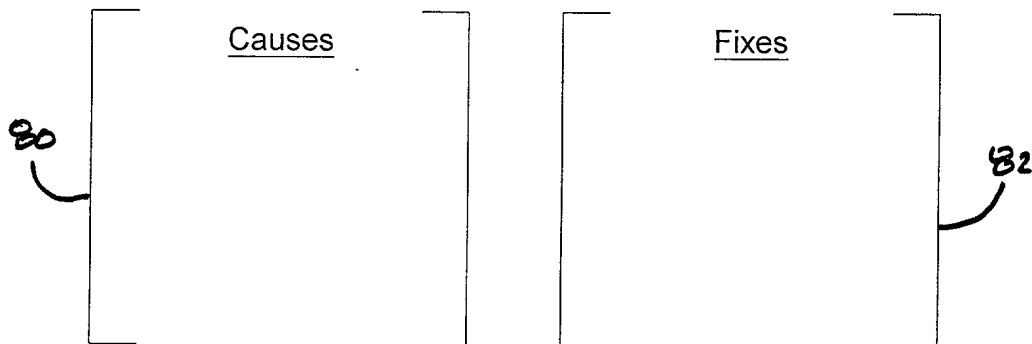


FIG. 5

FIG. 4

Title: Reusable Solutions For Aircraft Servicing

Inventor: Norden et al

Atty. Ref. No. 84-000203

Mark D. Elchuk, Harness Dill & Pierce (248) 641-1600

Service Engineering

Reusable Solutions



How To Use The Tool →

Tool Kit →

Primus Info →

Training Schedule →

Integration with BOECOM

Top Ten Questions

Structures Issues

Project Overview →

Go to Production Tool →



Take a Guest Tour

6,143 solutions available.
1,320 approved for SE statu.
312 approved for Boeing/ Custome.

Goal

Copyright © 2000 The Boeing Company - All rights reserved.

FIG. 6

6/21


This Tour gives you Read Access to the Production Data through a Guest account. Training is needed in order to effectively use the tool, but we are comfortable enough with the tool's intuitive nature and want you to see it first hand. The success of your search is subject to the limited amount of data currently in the tool. Contact Us if you have any questions.

User Name: Guest

Password: boeing (lower case)

Domain: bcsr@bcsrd (menu)

Place a significant amount of information in one or all Search Fields and select Search in upper left corner. Appropriately, Use the New Session and Logout buttons on the left.

Login to Service Engineering Tool  88


Login to Field Service & Customer Tool  86

FIG. 7

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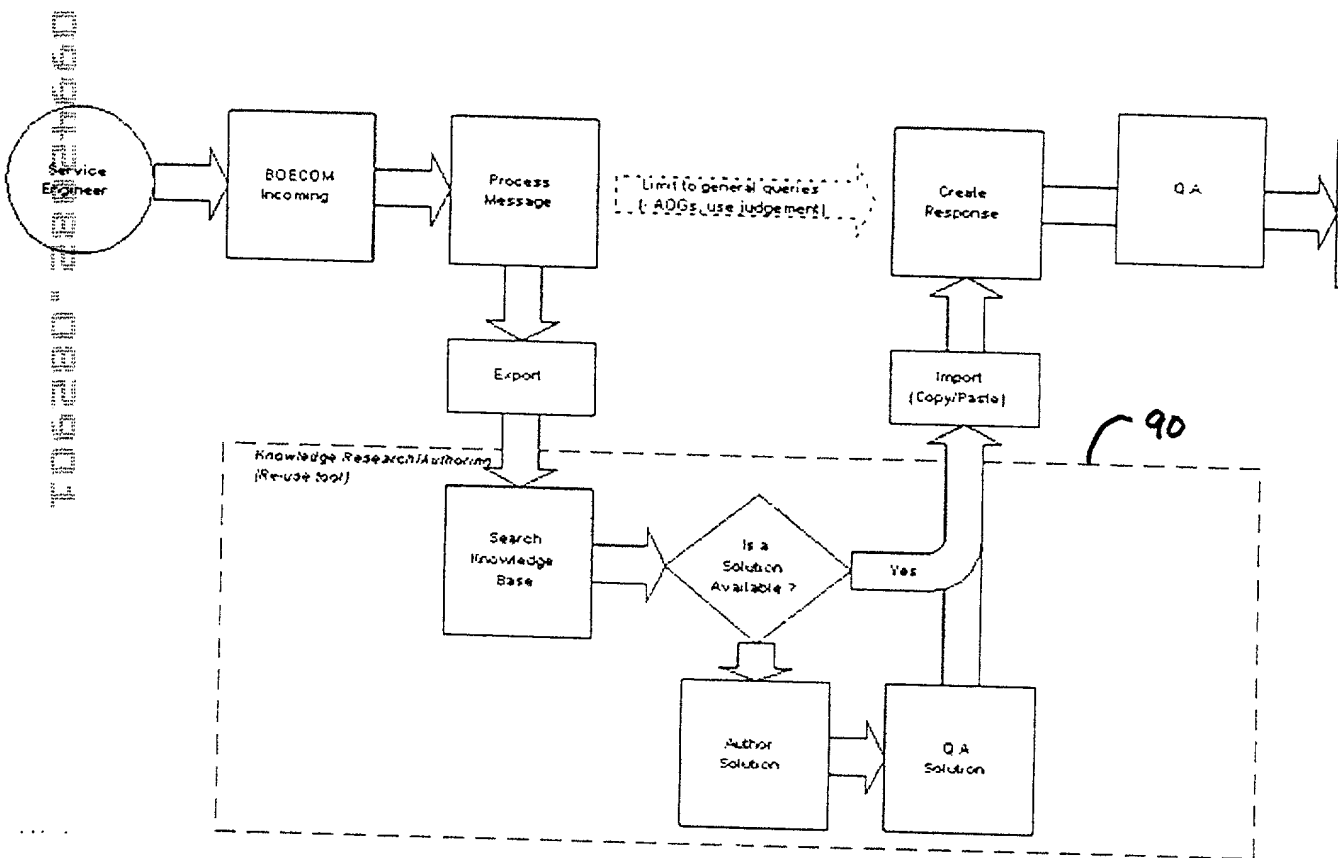


FIG. 8

PRIMUS



Goal

A Goal statement is a clear statement of your customer's objectives—what the customer is trying to do or the question. Good Goals help the troubleshooting process. A Goal statement also serves as the solution's title. ALL SOLUTIONS MUST CONTAIN AT LEAST ONE GOAL.

Examples of Good Goal Statements

- Goal:** How to repair a 3-inch longitudinal crack on the P&W 4000 engine nose cowl?
- Goal:** What are the operational restrictions to be followed for a "gear down" dispatch?
- Goal:** Resolution of electrical power loss condition.



Fact

Fact statements should be formal and detailed, including as much information as necessary to uniquely identify the product being described, such as: model, ATA, part number. Fact statements may also be clarifying statements that are "constant".

Examples of Good Fact Statements

- Fact:** Model: 747-400
- Fact:** ATA: 2161-00 Temperature Control Zone System
- Fact:** P/N: 60B92400-10 Fuel Boost Pump Pressure Switch
- Fact:** Condition occurred during landing

Facts Help Classify Problems

1. Do **not** put *multiple* Facts in a *single* statement.
2. Modify existing solutions to add new Facts as needed:



Symptom

Symptoms tell us what problems the customer is having. The conditions or events being observed that suggest or indicate something is discrepant (for example, flight deck effects, pilot reports).

1. Don't create "compound statements"—keep the **Facts** out of the **Symptoms** if you can.

Don't:
Symptom: Smoke coming out of the engine during landing on 737-200 approaching Singapore

Do:
Fact: Model: 737-200
Fact: Condition occurred during landing
Symptom: Smoke coming out of the engine

2. Make the thoughts complete:

Do:
Symptom: No. 2 Engine smoking on startup.
Symptom: 3 inch crack on inboard midflap torque tube

Flight Deck Messages: <exact message text >

Symptom: EICAS: AUTO SPEEDBRAKE

Symptom: CMC: 27-18830 GEAR TILT PRESSURE (L)

Ordering Symptoms

If your solution has multiple Symptoms, order them in the solution as follows:

- More detailed first
- Less detailed second

Example of Good Symptom Statements

If a customer reports getting the message EICAS: FIRE CARGO AFT on 747-400 and fire warning bell on:

Fact: Model: 747-400

Symptom: EICAS: FIRE CARGO AFT

Symptom: Fire warning bell on

Mark D. Eick, Harness Dickey & Pierce, (248) 641-1600

Change

What has changed recently, or what maintenance actions were completed before the anomaly occurred? Not what was changed during the course of troubleshooting.

1. Think about what the customer may have done:
Change: Replaced actuator.
Change: New wiring installed.
2. Changes are not the cause—don't confuse the two.
3. Do not jump to conclusions:

Don't:

Change: The system worked before we installed a faulty processor card.

Do:

Change: Installed a new processor card.



The Root Cause as the Key to Solutions

There should be only **one cause per solution**. If a solution has more than one possible Fix, is it the **same** problem or is it a **similar** problem? If it's the **same** problem, then its **cause** is identical. In this case, the solution may contain more than one Fix statement—but **all** Fix statements must be applicable.

If you must decide between applying one Fix statement or another (because only one will work), the solution should be split into two!

1. Share as many common statements as possible among solutions.
2. Add unique statements to differentiate solutions.



Fix

Fix statements are the resolution of the problem. They resolve the customer concern, or provide the answer to the question.

Author the **Fix** as a stand alone

- Add Notes within the Fix as needed to improve readability or to identify its applicability
- If several steps must be performed in order, number the steps.
- Write using present tense.
- If a Solution is long and refers to multiple documents, list them as named references within the Fix and use the named reference numbers within the fix.
- Make sure these references are also recorded as **Facts** for the solution.
- Use spaces to format the statement for readability.
- Write everything as a present tense list of commands, as if you were reading them step-by-step to the customer.
- Do not include "if-then" statements in Fixes. This is an indication that you have two separate solutions.

A Great Sample Solution

Goal: Repair heat damaged strut stringer.
Fact: P/N: 65B98746-12 STRUT STRINGER
Fact: Model: 747
Fact: JT9D-7 inboard engines

Symptom: Conductivity readings in excess of 39

Symptom: Heat damaged strut.

Cause: Bleed air valve leak

- Fix:**
1. Reinforce the stringer with a nested angle fabricated from 2024-T6, 0.125 min gauge.
 2. Fasten with existing fastener locations.
 3. Maintain 2D spacing and 1.4D edge margin

HTML Syntax used to link to files/solutions.

linked Primus web site

linked Solution where xxx is the local prefix and ### is the number of the solution

linked Network file

 Rendering an image of a network file (jpg, gif, bmp, etc.)

Tables: save table as an 'HTML' file, view in a browser, copy 'source' and paste into role (html)

STEPS TO CREATING A SOLN.

1. Search for an existing solution, use Matching statements to help. Only create a solution if you can not find an existing one.

2. Open the Create New Solution Frame

3. Add statements, using diverse and appropriate statement roles as described here, but **especially multiple symptoms and changes.**

- **Be explicit.** For example saying 'won't actuate' is unclear -what won't actuate? It is better to say: 'Leading edge flap drive unit won't actuate'.

- Write using **present tense.**

- In a 'fix' **don't** tell us what you did; **tell us what to do** in a step by step and complete process.

4. Find matching statements, adding or replacing as applicable. It is very important to reuse existing statements for better search efficiency and higher quality solutions

5. Optional: add hyperlinks to other solutions or files

6. Check for duplicate solution: Select 'copy to problem description as Current Id'. If a similar or nearly duplicate solution exists, consider consolidating the two into one solution

7. Be sure to have a **meaningful and useful title.** (comes from 1st goal, or as defined in 'properties')

8. Check spelling

9. Change default **Property** values as necessary. Status default is 'draft'. Set **Type** to either 'systems', 'structures', or 'non-technical'.

- 10.. **Save the solution.**

Properties - Status

Draft:

This is the default at time of initial creation and for work in progress. A Cause and Fix may or may not have been determined; additional data may be needed to complete the solution.

Review:

Solution contains a Fix (and cause if applicable) and is ready to be reviewed for content standards and technical correctness.

Approved for SE Group: Solution has a Fix (and Cause if known), it has been reviewed and has undergone QA and is approved for use by the SE.

Approved for SE: As above, but approved for viewing by SE group SME.

Approved for Boeing:

As above, but approved for viewing by Boeing.

Approved for Customer:

As above, but approved for viewing by customers.

Return:

An approved solution requiring updating.

Obsolete:

Retained for background information.

Detailed Criteria for the "Approved" Status levels are provided on our web site under Approval Process, Solution Approval Criteria.

Things you don't need to say!

Because each Primus application statement is assigned a role, certain phrases are *unnecessary* when writing statements:



"I want to," "The customer is trying to"



"The customer is using..."



"The customer is getting..."

FIG. 9

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Fig. 10

YATech Support\Structures\Reusable Soln\FrontEnd\solution.html - Microsoft Internet Explorer	
File Edit View Favorites Tools Help	
Back Forward Stop Refresh Home Search Favorites History Mail Print Edit	
Address YATech Support\Structures\Reusable Soln\FrontEnd\solution.html	
SOLVES PROBLEM!	
Previous Close Next	
Solution 1 of 2	
Title: PN: 65B05133-13, center journal OD = 5 730 blend(OD) = 0 012 Rc = 54 2 FOR TEST ONLY	
ID: bcsrd5664 Searchable: Yes Domain: bcsr Author: tjs0677 Modified By: tjs0677 Type: Structures	
Status: Review Solution Class 4.X Owner: Melnick Date Created: 10/03/2000 Date Modified: 10/03/2000	
Location None	
Structure Type Landing Gear / Model 747 / WLG / Truck Beam Assy, Complete / Axle / Center Journal	
Model 747	
ATA 3210-10, 3212-30, 3213-30	
Part/Drawing Number 65B05133-13	
Airplane information VIN None	
Title PN: 65B05133-13, center journal OD = 5 730 blend(OD) = 0 012 Rc = 54 2 FOR TEST ONLY	
Attachment Sheet A	
Detail OD (1) = 5.730	
Detail OD (1) Blend depth = 0.012	
Detail Blend is located at the brake sleeve / truck interface	
Detail ID (11) = 4 415	
Detail ID (12) = 4.536	
Boeing Pub ohm 32-10-22 fig 405 circle 1 OD - design (Cr plated) = 5 7525/5.7535	
ohm 32-10-21 fig 401a circle 1 OD - repair limit = 5.724	
ohm 32-10-22 fig 405 circle 11 ID - design varies by part number	
ohm 32-10-21 fig 401a circle 11 ID	
ohm 32-10-22 fig 405 circle 12 ID - design = 4 520/4 540	
ohm 32-10-21 fig 401a circle 12 ID	
ohm 32-10-21 fig 401a circle 11, 11, 12/	
Boecom Folder 65B05133 JRNL DIM /1,11,12/	
Action File JAL-NRT-91-5017TE	
Boecom Telex JAL-NRT-91-5087RE	
Fix The ref axle is structurally acceptable for continued use. Nickel fill blends followed by chrome plate back to design OD (0 015 inch max thickness) Continue to process the part per CMM 32-00-05 in conjunction with OHM 32-10-22.	
Done	

FIG. 11

Pinus® eServer 4.0.b - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Refresh Home Search Favorites History

Address http://v1techsupport/structures/ReusableSolnFrontEnd/Us...create.html

Go Links

Commercial Aviation Services

BOEING

BOEING

Create New Solution

Notes Archive

Clipboard Check Spelling Help

SAVE Cancel

VIEW HOT SOLUTIONS

DESCRIBE THE PROBLEM

VIEW THE SOLUTIONS

ESCALATE THE PROBLEM

CREATE NEW SOLUTION

QUERY THE SOLUTIONS

OPEN ID GO

SET PREFERENCES

NEW SESSION

LOGOUT

HELP

commercial airplanes

Location

Modify Add

BSTA

400 - 420

StructureType

Modify Add

STR

5L-2R

StructureType

Modify Add

Stringer

Part Number

Hardness (Rc)

Model Number

None

V/N

Hours

Solution Status

SE Group

ATA Number

L/N

Cycles

Boeing Pub

Solution Types

Structures

Registry

MTGW

Boeing Pub

Other Reference

Add:

Title

Attachment

Detail

Boecom Folder

Action File

Boecom Telex

Boeing Pub

Other References

Fix

PT 6.12

96


Primus eServer 4.0b - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Refresh Home Search Favorites History Mail Print Edit

Address Y:\Tech Support\Structures\Reusable Sort\FortEnd\searchresults.html

Commercial Aviation Services



commercial airplanes

VIEW HOT SOLUTIONS

DESCRIBE THE PROBLEM

VIEW THE SOLUTIONS

ESCALATE THE PROBLEM

CREATE NEW SOLUTION

QUERY THE SOLUTIONS

OPEN ID

GO

SET PREFERENCES

NEW SESSION

LOGOUT

HELP

View the Solutions (20 solutions found)

Sort by Solution Relevance

P/N: 65805133-2, Center Journal OO = 5.720, Blend (OO) = 0.0095, Rc = 53.7

P/N: 65805133-2, Center Journal OO = 5.724, Blend (OO) = 0.020, Rc = 54.7

P/N: 65805133-2, Center Journal OO = 5.728, Rc = 52

P/N: 65805133-2, Center Journal OO = 5.733, Blend (OO) = 0.043, Rc = 55.8

P/N: 65805133-9, Center Journal OO = 5.715, Rc = 54.5

P/N: 65805133-9, Center Journal OO = 5.724, Blend (OO) = 0.002, Rc = 54.7

P/N: 65805133-9, Center Journal OO = 5.724, Blend (OO) = 0.011, Rc = 53.7

P/N: 65805133-9, Center Journal OO = 5.732, Rc = 54.5

P/N: 65805133-9, Center Journal OO = 5.735, Blend (OO) = 0.0075, Rc = 54.1

P/N: 65805133-13, Center Journal OO = 5.734, Blend (OO) = 0.003, Rc = 54.7

P/N: 65805133-13, Center Journal OO = 0.005, Rc = 55.5

P/N: 65805133-13, Center Journal OO = 5.725, Blend (OO) = 0.010, Rc = 54.2

P/N: 65805133-13, Center Journal OO = 5.728, Blend (OO) = 0.009, Rc = 54.2

P/N: 65805133-13, Center Journal OO = 5.729, Rc = 55.7

P/N: 65805133-13, Center Journal OO = 5.730, Blend (OO) = 0.010, Rc = 52.6

P/N: 65805133-13, Center Journal OO = 5.730, Blend (OO) = 0.012, Rc = 53.2

P/N: 65805133-13, Center Journal OO = 5.730, Blend (OO) = 0.032, Rc = 54.7

P/N: 65805133-13, Center Journal OO = 5.731, Blend (OO) = 0.016, Rc = 53.9

P/N: 65805133-13, Center Journal OO = 5.736, Blend (OO) = 0.032, Rc = 53.4

P/N: 65805133-23, Center Journal OO = 5.732, Rc = 55

View Solution Statements

57%

57%

54%

54%

58%

57%

57%

58%

57%

54%

54%

57%

57%

55%

64%

64%

64%

54%

57%

54%

Refine the Problem

Use Query to Limit Search

Location

Media

Add

Structure Type

Media

Add

Discrepant dimension/condition

Part Number

Hardness (Rc)

Solution Status

SE Group

Solution Types

Structures

Other Databases

Model Number

None

V/N

Hours

ATA Number

L/N

Cycles

Boeing Pubs

None

Registry

MITGW

Other

References

UPDATE SEARCH

Help

Local Intranet

FIG. 13

Incoming Message

X Draft or Incoming Message

Action File Name:*

FIS-06-DEC-99-D489

Prep Date:

06-DEC-99

Author:*

Rudolph

Group:*

FIS

Model:*

737

ATA:*

5770-40

Opr:

Base:

Airline Support:*

DEP:*

Subject:

Aluminum Spoiler Fitting Spherical Bearing Bore Corrosion

Due Dates:

13/21

Home Office: Field:

Draft Message Number:*

FIS-06-DEC-99-D489

Type:*

BOECON

Airplane...

Start KB

Notes...

App Row

FIG. 14A

Draft Outgoing Message

Title: Reusable Solutions For Aircraft Servicing

Inventor: Norden et al

Atty. Ref. No.: 7784-000203

Mark D. Elchuk, Harness Dickey & Pierce, (248) 661-1800

X Draft or Incoming Message

Action File Name:*

FIS-06-DEC-99-D489

Prep Date:

06-DEC-99

Author:*

Rudolph

Group:*

FIS

Model:*

737

ATA:*

5770-40

Opr:

Base:

Airline Support:*

DEP:*

Subject:

Aluminum Spoiler Fitting Spherical Bearing Bore Corrosion

Due Dates:

14/21

Home Office:

Field:

Draft Message Number:*

FIS-06-DEC-99-D489

Type:*

BOECOM

Airplane...

Get solution
Text

Notes...

App
Rou

Repair by opening bore up by 0.060 and install a swaged sleeve

Fig. 14B

File Edit Links

Finding a Solution

View Solution Titles Only

79%

View the Solutions (1 solution found)

Select a title for the details. If none apply, refine your description below.

spherical bearing bore corrosion

ADD: 737

65-67186

ADD: 737

5770-40

ADD: 737

Oversized

ADD: 737

Aluminium spoiler fitting

ADD: 737

spherical bearing bore corrosion

ADD: 737

VIEW HOT SOLUTIONS

commercial airplanes

VIEW HOT SOLUTIONS

DESCRIBE THE PROBLEM

This is the info that came from the inbound message

This is the fix that was found

REFINE THE PROBLEM

Update your current statements, or add new ones. Click Update Search to search on the revised description.

ADD: 737

Spherical bearing bore

5770-40

UPDATE SEARCH

ID: (solution not saved)

Quick Refine

Solution Properties

Editor Help

Show Clipboard

SET PREFERENCES

NEW SESSION

LOGOUT

HELP

FIG. 15

[illegible]

our selected solution:

puas

Solution 1 of 1

[Previous](#) | [Close](#) | [Next](#)

SOLVES PROBLEMS!

Title: spherical bearing bore corrosion

Comments

History

Use as Problem Description

ID: 2.0.34838.2452666

Domain: boeing

Owner: administrator

Partition: Unassigned

Type: repair verification

Status: Technical reviewed

Fact 737

131

Fact	65-67186
------	----------

65-67186

Fact 5770-40

5770-40

Fact Oversized

oversized

Fact Aluminium spoiler fitting

Aluminium spoiler fitting

Symptom spherical bearing bore corrosion

spherical bearing bore corrosion

✓ **Fix**

Typical repair for this bore - Open the bore up by 0.060 and install a swaged sleeve:

More

is the



previously structurally OK

-x opened up to 1.060 max and installed bushing

-8 opened to 1.008

-10 opened to 1.006 in this case there were wear marks on the faces/structurally OK for hard anodize

Notes: Overhaul manual reference 57-56-61 material 7075-T6 design diameter -4, -9, -10 is 1.000-1.003

११७१३

L
C
T
O
L

T
J

Re-useable solution Search Window:

Title: Reusable Solutions For Aircraft Servicing
Inventor: Norden et al
Atty. Ref. No: 7784-000203

Primus® eServer 4.0 a - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Refresh Home Search Favorites History Mail Print Edit

Address http://soldev.cs.boeing.com/demo/explorer.asp

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SEARCH

None

Describe the Problem

Type what you know about the problem, and click Search.

Issue Type: Problem

Select the Model Number:

Describe the Task you are trying to perform:

Air Conditioning Pack Air Cycle Machine Removals Due to Seizures

Part #'s, Model #'s or other Facts:

Model: 767
Opening: ANZ-AKL-00-00197F
Action File: ANZ-AKL-00-00197F

Describe the Symptoms of the problem (What characteristics indicate that there is a problem?):

Describe any recent Changes that may be associated with the problem:

VIEW HOT SOLUTIONS

DESCRIBE THE PROBLEM

VIEW THE SOLUTIONS

ESCALATE THE PROBLEM

CREATE NEW SOLUTION

QUERY THE SOLUTIONS

OPEN ID Go

SET PREFERENCES

NEW SESSION

LOGOUT

HELP

BOEING

commercial airplanes

BOEING

Commercial Aviation Services

Start a new Primus® eServer session.

Local intranet

FIG. 17A

7

Add symptoms and/or additional facts and information to initiate search on an existing solution(s).

Primus® 6

VIEW Edit Back

Address: http://soldev.cs.boeing.com/demo/explorer.asp

Commercial Aviation Services

BOEING

commercial airplanes

VIEW HOT SOLUTIONS

DESCRIBE THE PROBLEM

VIEW THE SOLUTIONS

ESCALATE THE PROBLEM

CREATE NEW SOLUTION

QUERY THE SOLUTIONS

OPEN ID Go

SET PREFERENCES

NEW SESSION

LOGOUT

HELP

BOEING

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VIEW HOT SOLUTIONS

DESCRIBE THE PROBLEM

VIEW THE SOLUTIONS

ESCALATE THE PROBLEM

CREATE NEW SOLUTION

QUERY THE SOLUTIONS

OPEN ID Go

SET PREFERENCES

NEW SESSION

LOGOUT

HELP

18/21

SEARCH

None

Describe the Problem
Type what you know about the problem, and click Search.

Issue Type: Problem

Select the Model Number:

Describe the Task you are trying to perform:
Air Conditioning Pack Air Cycle Machine Removals Due to Seizures

Part #'s, Model #'s or other Facts:
Model: 767
Opening: ANZ-AKL-00-00197F
Action File: ANZ-AKL-00-00197F

Describe the Symptoms of the problem (What characteristics indicate that there is a problem?):
Possible ice formation in ACM during hot and humid conditions

Describe any recent Changes that may be associated with the problem:

FIG. 17B

Start a new Primus® eServer session.

Solution Reuse: 02 Oct 2000

Export solution into Outgoing BOECOM-message

Primus® eServer 4.0 a - Air Conditioning Pack Air Cycle Machine Seizes. - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Refresh Home Search Favorites History Mail Print Edit

Address 59149cc42d6183%2D11d42d6b010%2D0000bea6738&resource=&target=WorkArea&NormalSolution= True&DisplayID=bcsrd49&unique=9%2F18%2F2000%3%3A22%3A19+PM

Commercial Aviation Services

BOECOM

BOEING

commercial airplanes

VIEW HOT SOLUTIONS

DESCRIBE THE PROBLEM

VIEW THE SOLUTIONS 4

ESCALATE THE PROBLEM

CREATE NEW SOLUTION

QUERY THE SOLUTIONS

OPEN ID Go

SET PREFERENCES

NEW SESSION

LOGOUT

HELP

SOLVES PROBLEM

Previous | Close | Next

Comments | History

Copy to problem description as New | Current ID

Selected Solution

Here is information on your selected solution:

Modify Delete Send

Solution 1 of 1

Title: Air Conditioning Pack Air Cycle Machine Seizes.

Show Properties

ID: bcsrd49 Searchable: Yes

Domain: bcsr Class: 4.X

Goal Air Conditioning Pack Air Cycle Machine Seizes.

Fact Model: 767

Fact ATA: 2151-10

Fact Opening: ANZ-AKL-00-00197F

Fact Closing: ANZ-AKL-00-00374H

Fact Action File: ANZ-AKL-00-00197F

Symptom Air Conditioning Pack Air Cycle Machine Seizes.

Cause The air conditioning system operation could result in ACM failures due to ice formation.

Fix During hot humid operations the pack will remove large amounts of water from the air. Under these environmental conditions, the air conditioning system operation could result in (ACM) failures due to ice formation for the following possible reasons:

1. Clogged water separator drain lines backing the water up into the pack and causing icing.

2. Dirty condenser / Reheater circuit resulting in reduced airflow could create a potential icing condition.

3. Blocked Low Limit Valve (LLV) sense lines resulting in the LLV not recognizing a icing condition. Therefore not opening to provide hot air to melt the ice build up.

Export to BOECOM

FIG. 17D

Primus® eServer

Done

**Fix will be copied to BOECOM Draft
and BOECOM items will
automatically
be passed from Primus tool when
solution is used.**

FIG 17E